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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/576,787	04/21/2006	Toru Nebashi	1032865-000025	5903

21839 7590 01/15/2009
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

PHAN, THIEM D

ART UNIT	PAPER NUMBER
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3729

NOTIFICATION DATE	DELIVERY MODE
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01/15/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No. 10/576,787	Applicant(s) NEBASHI ET AL.	
	Examiner THIEM PHAN	Art Unit 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 October 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 20-30 and 36 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 20-3, 36 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on 10/08/08 has been fully considered and made of record.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 20, 21, 30 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al (US 5,655,704) in view of Razon et al (US 6,634,545).

Regarding claim 20, Sakemi et al teach an apparatus (Fig. 1, A) for mounting soldering balls (Fig. 4, 3), after setting a mask (4) on a substrate (2), in a plurality of apertures (4a) in the mask for disposing conductive balls on the substrate, the device comprising:

- a head including a means (Fig. 1, 12) for gathering conductive balls toward an area (Fig. 3, 4d) that is part of a surface of the mask from around the area; and
- a head supporting device (Fig. 1, 10 & 5) for supporting the head and moving the head along the surface of the mask; and
- a ball supplying device (Fig. 1, 14) for supporting conductive balls to the area (Fig. 3, 4d); except for having the ball supplying device being mounted on the head supporting device and moving together with the head.

Art Unit: 3729

Razon et al teach a solder ball delivery system with a ball supplying device (Fig. 7, 602) being mounted on the head supporting device (600) and moving together with the head (608).

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify the head apparatus of Sakemi et al by applying the coupling of the ball supplying device with the head, as taught by Razon et al and not its general structure, in order to expand the delivery area to include areas 4c in Figure 3 and to continuously feed the solder balls to the head system for faster production.

Regarding claim 21, Sakemi et al teach that the head supporting device (Fig. 1, 10 & 5) is capable of moving the head across the surface of the mask in at least one of an arbitrary direction, a direction that traces a zigzag, and a direction that traces a spiral (Fig. 3, Arrow Movement).

Regarding claim 30, Sakemi et al teach a mounting apparatus comprising: a filling device (Fig. 1, 14); and a device creating movement (Fig. 2, N1-N3) for setting the mask (4) on a substrate (2).

Regarding claim 36, Sakemi et al teach a sensor to detect appropriate solder balls at the ball container (Fig. 2, 12; col. 6, lines 50-54) or the workpiece (2) to supply proper amount of balls at predetermined time intervals or based on ball density of the area.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

Art Unit: 3729

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 22-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al in view of Razon et al and further view of Yoshihiro et al (JP9-148332).

Regarding claim 22, Sakemi et al in view of Razon et al teach an apparatus (Fig. 1, A) for mounting soldering balls including a moving head (Fig. 1, 12) to gather conductive balls (Fig. 4, 3) across the surface (Fig. 3, 4d) of the mask, which reads on applicants' claimed invention.

Yoshihiro et al teach a particle arranging apparatus wherein the head supporting means (Fig. 4, 20) includes:

- a means for rotating the head (Fig. 4, 23) about a shaft (Fig. 4, 25) that is perpendicular to the mask (20) and a means for moving the shaft across the surface of the mask through spinning, and
- the means (24a & 24b) for gathering conductive balls moves conductive balls (2), by rotating the head, toward the area that is a circular area (21a) centered on a center of rotation of the head, in order to efficiently insert the conductive balls into the holes (Fig. 1, 5; paragraph 30) of the mask.

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify the head apparatus of Sakemi et al in view of Razon et al by applying the rotating head insertion of the conductive balls, as taught by Yoshihiro et al, in order to efficiently insert the conductive balls into the holes of the mask.

Art Unit: 3729

Regarding claim 23, Yoshihiro et al teach that the means for gathering conductive balls is a sweeper (Fig. 4, 24a & 24b) for sweeping a part of the surface of the mask around the circular area by using members that protrude from the head.

Regarding claim 24, Yoshihiro et al teach that the sweeper (Fig. 4, 24a & 24b) presses the part of surface of the mask around the area by using the members that protrude from the head.

Regarding claim 25, Yoshihiro et al teach that the means for gathering conductive balls includes a plurality of squeegees (Fig. 4, 24a or Fig. 3, 6 for detail) that protrude from the head toward the surface of the mask and sweep a part of the surface of the mask around the circular area.

Regarding claim 26, Yoshihiro et al teach that the plurality of squeegees (Fig. 4, 24a or Figs. 1 & 3, 6 for detail) extend in a tangential direction for the circular area.

Regarding claim 27, Yoshihiro et al teach that the plurality of squeegees (Fig. 4, 24a or Figs. 1 & 3, 6 for detail) are arranged so as to overlap in a direction of movement thereof.

Regarding claim 28, Yoshihiro et al teach that the plurality of squeegees (Fig. 4, 24a or Figs. 1 & 3, 6 for detail) press the part of the surface of the mask the circular area.

6. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sakemi et al in view of Razon et al and further view of Inoue et al (US 6,402,014).

Art Unit: 3729

Sakemi et al in view of Razon et al teach an apparatus (Fig. 1, A) for mounting soldering balls including a moving head (Fig. 1, 12) to gather conductive balls (Fig. 4, 3) across the surface (Fig. 3, 4d) of the mask, which reads on applicants' claimed invention; except for having a nozzle for sweeping together conductive balls by blowing out gas from the head to the around the area.

Inoue et al teach an apparatus for forming bumps (Fig. 11, 3) with a nozzle (12) for sweeping together conductive balls by blowing out gas (13) from the head to the around the area, in order to insert the conductive balls into the holes (6) of the mask (2a), fast and at low cost (Col. 1, lines 55-57).

It would be obvious to one of ordinary skill in the art at the time the invention was made to modify the head apparatus of Sakemi et al in view of Razon et al by applying the blowing out gas nozzle to the conductive balls, as taught by Inoue et al, in order to insert the conductive balls into the holes of the mask, fast and at low cost.

Response to Arguments

7. Applicants' arguments with respect to claims 20-30 have been considered but are moot in view of the new ground(s) of rejection.

Furthermore, applicants' assertions that Sakemi et al do not teach or suggest "a means for gathering conductive balls toward an area that is part of a surface of the mask around an area" (Remarks, page 8) are traversed because Sakemi et al teach that means, which is construed as the

Art Unit: 3729

wall of the head (Fig. 4, 12) to gather conductive balls toward an area that is part of a surface of the mask around an area.

Regarding the remarks on page 9, Yoshihiro et al teach that “the means (Fig. 4, 24a & 24b) for gathering conductive balls moves conductive balls (2), by rotating the head, toward the area that is a circular area (21a) centered on a center (Center of 25) of rotation of the head” (Claim 22) and that area is construed as area 21a. It appears that applicants fail to recognize the scope of the claim when judged in view of Yoshihiro et al. (*See* MPEP 2111 and *In re Geuns*, 26 USPQ 2nd 1057 (Fed. Cir. 1993)).

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicants' disclosure.

Applicants' amendment necessitated the new grounds of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicants are reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the

Art Unit: 3729

mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tim Phan whose telephone number is 571-272-4568. The examiner can normally be reached on M & Tu, 6AM - 2PM, and W & Th, 9AM – 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/A. Dexter Tugbang/
Primary Examiner
Art Unit 3729

/Phan Thiem/
Examiner, Art Unit 3729

January 13, 2009